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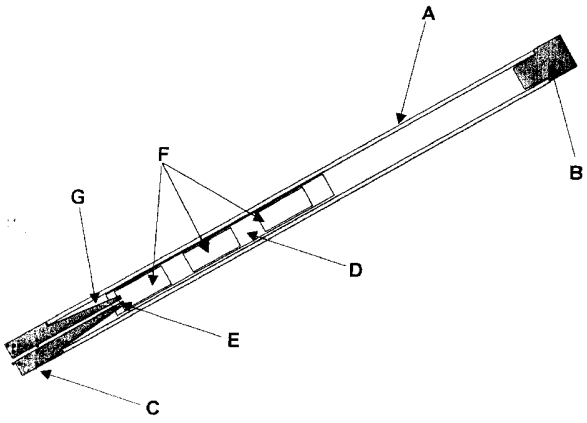
(56) Documents Cited:
WO 2006/018619 A1 **WO 1996/027795 A1**
US 3768978 A **US 20030026731 A1**

(58) Field of Search:
INT CL **G01N**
Other: **EPODOC, WPI**

(54) Abstract Title: **An integrated liquid sampling and testing device for evaluating substances within potable liquids**

(57) An integrated liquid sampling and testing device for potable liquids comprising a housing in the form of a waterproof tube (A), with one end (the distil end of the device) sealed such that it is air and liquid tight (B). The near end of the tube has an insert (C) which acts as an internal pipette when the device is operated and liquid is sampled into the device. Inside the tube (A) immediately above the end of the internal pipette (E) is an absorbent strip (D) onto which the diagnostic chemicals are placed (F). When pressure is applied by squeezing the device to expel air, then the device is dipped into liquid and then the pressure is released, liquid enters via the inlet (C) activates the diagnostic chemicals (F) as the liquid is absorbed and wicks up the strip (D). The result of the analysis can be seen as a colour change in the diagnostic chemicals through the transparent or translucent tube (A). The reservoir (G) prevents the liquid sample inside the device being expelled back into the original potable liquid.

Figure 2



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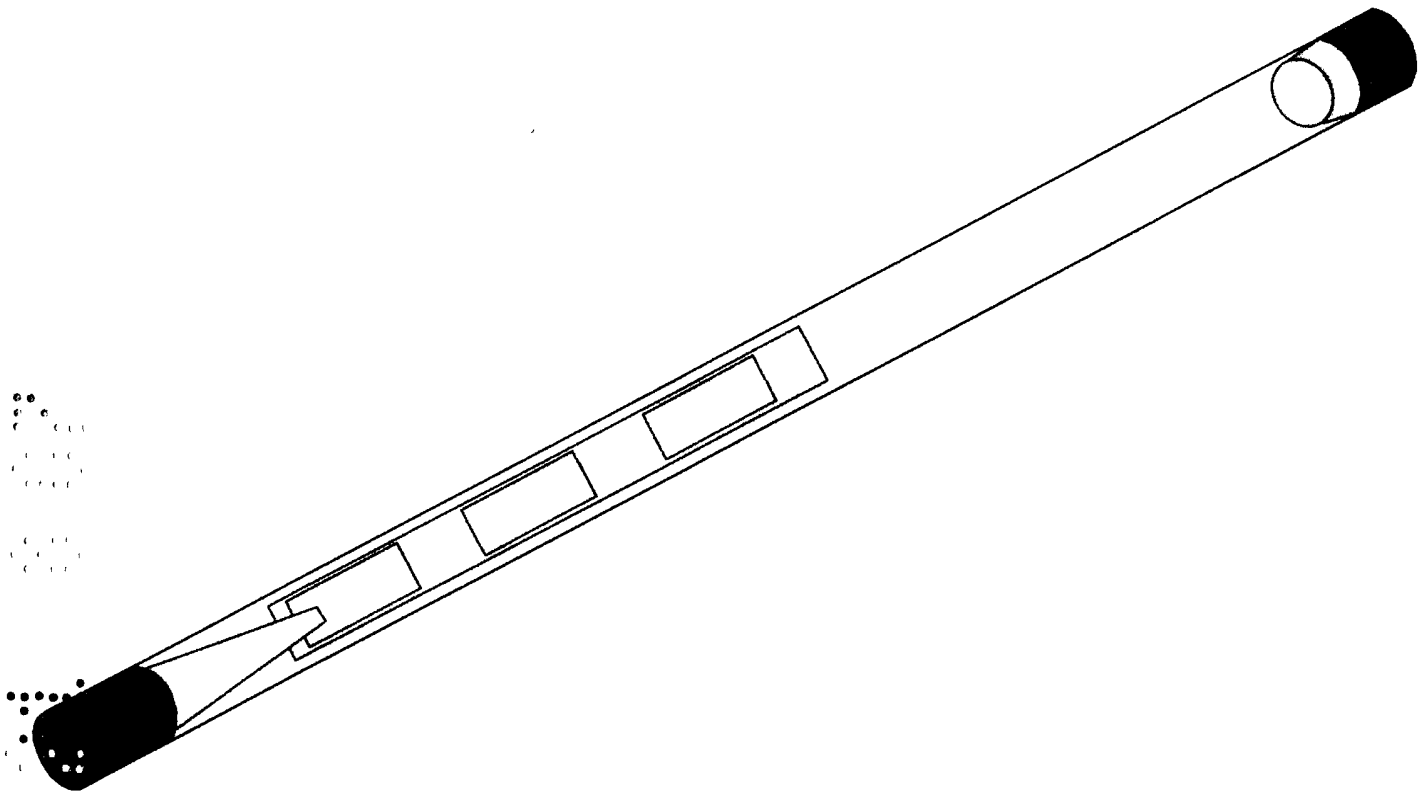
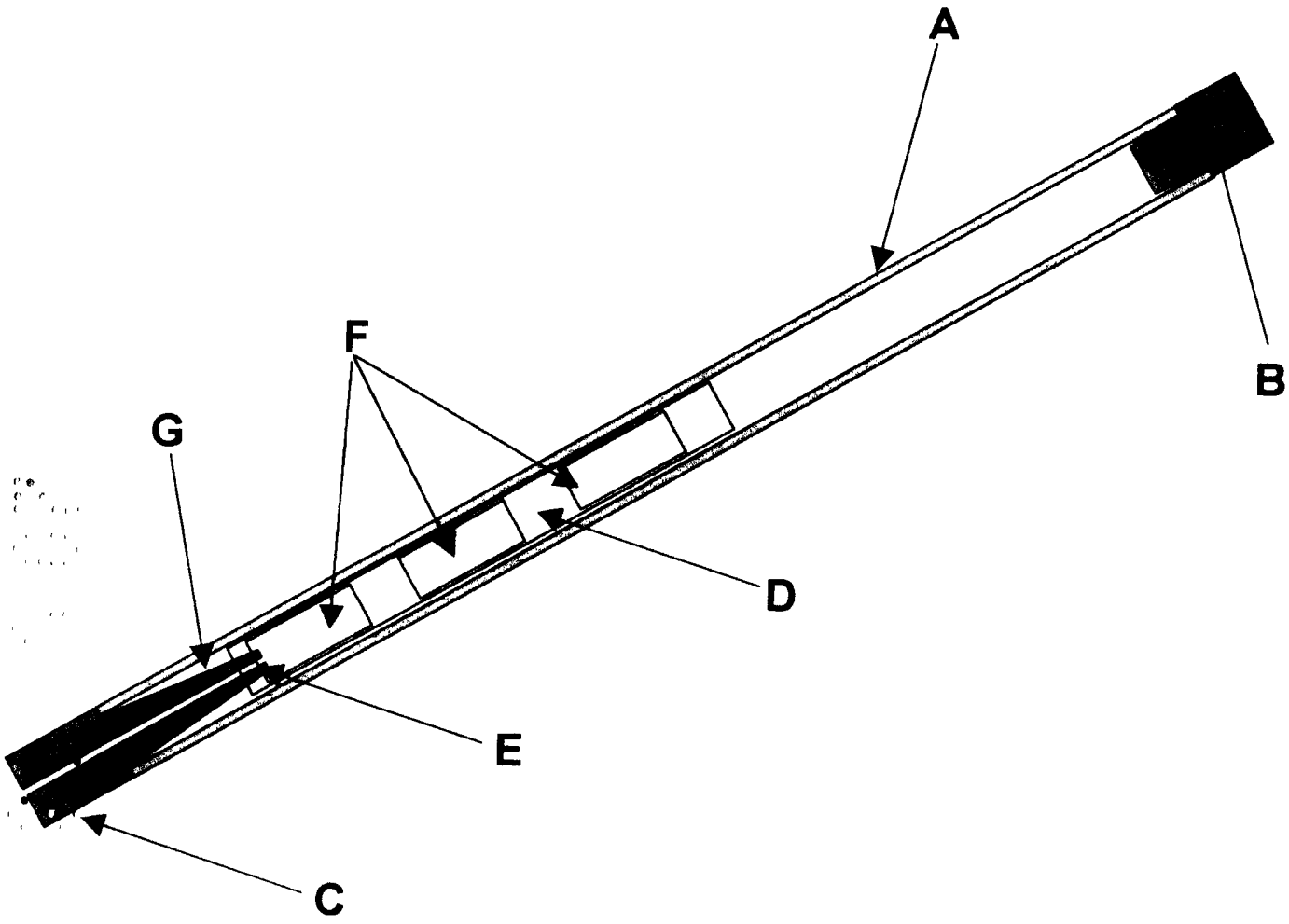
Drawing: Figure 1



Drawing: Figure 2



Description:
Integrated liquid sampling and testing device.

This is a liquid sampling and testing device specifically designed to allow a small sub-sample of a liquid, such as a potable drink, to be collected simply and easily for analysis inside the device, but which prevents any possible contamination of the original liquid e.g. the drink.

The design specifically prevents any chemicals contained within the device, which are used for the analysis process and which are activated (solubilised) during the sampling process, be allowed to egress the device back into the original liquid, thus contaminating it.

It is ideal for use in such applications as drink adulteration where the diagnostic chemicals within the device may be toxic to humans and thus cannot be allowed to contaminate the original drink during the sampling process. The device may also be used for other liquid sampling applications where the sample liquid may be toxic in some way and minimal handling is required in order to protect the user during the sampling process.

The overall design of the device is shown in Figure 1 with a cross sectional area shown the Figure 2.

With reference to Figure 2, the device consists of a transparent or translucent plastic tube (A) with one end (the distil end of the device) sealed such that it is air and liquid tight (B). The near end of the tube has an insert (C) which acts as an internal pipette when the device is operated and liquid is sampled into the device. Inside the tube (A) immediately above the end of the internal pipette (C) is an absorbent strip (D) onto which the diagnostic chemicals are placed (F).

In operation the user squeezes the tube (A) between his or her fingers to expel air from inside the device. The near end of the device (C) is then inserted into the liquid to be sampled and pressure on the tube is released causing liquid to be sucked into the device through the internal pipette at point

(E). The liquid activates the diagnostic chemicals (F) as the liquid is absorbed and wicks up the strip (D). The result of the analysis can be seen as a colour change in the diagnostic chemicals through the transparent or translucent tube (A) Should the user try and reuse the device by squeezing the device again, either on purpose or accidentally, whilst the device is still in the original liquid, the liquid sample inside the device is prevented from being expelled into the original liquid by the reservoir effect at point (G). Any excess liquid not absorbed by the absorbent strip (D) is trapped around the internal pipette by gravity and surface tension effects and only air is expelled from the device through the pipette opening.

An integrated liquid sampling and testing device for evaluating substances within potable liquids

Claims:

1. An integrated liquid sampling and testing device for evaluating substances within potable liquids, the integrated liquid sampling and testing device comprising a translucent or transparent body.

2. An integrated liquid sampling and testing device according to claim 1, in which the substance within the potable liquid may or may not be an illicit obnoxious substance.

3 An integrated liquid sampling and testing device according to claim 1, in which the body is a tube.

4. An integrated liquid sampling and testing device according to claim 3, in which the material forming the tube of the sampling and testing device is non porous to the passage of a variety of liquids including water and alcohol.

5. An integrated liquid sampling and testing device according to claim 3, in which the body of the integrated liquid sampling and testing device is a non porous drinking straw.

6. An integrated liquid sampling and testing device according to claim 3, wherein there is one end that is air tight, with the air tight seal formed by some form of stopper, or by some method of physically sealing the ends of the tube.

7. An integrated liquid sampling and testing device according to claim 3, wherein the body is a tube, the tube having an inlet, and an indicator means carried by the body capable of changing physical characteristics when contacted by said substance within a potable liquid in which the body is placed.

8. An integrated liquid sampling and testing device according to claim 7, in which the inlet collects a sub-sample of the potable liquid for evaluation allowing the device to continue operation when the device is removed from the main source of potable liquid.

9. An integrated liquid sampling and testing device according to claim 7, wherein the inlet acts as an internal pipette and the indicator means is a porous substrate within the body and arranged so as to be contacted by the ingress of liquid through the inlet when the cylinder is inserted into the drink.

10. An integrated liquid sampling and testing device, according to claim 7, wherein the indicator means allows for the controlled flow of liquid from the inlet to the reagent medium.

11. An integrated liquid sampling and testing device according to claim 7, wherein the indicator means includes one or more chemical reagents to allow for the detection of substances within the potable liquids.

12. An integrated liquid sampling and testing device according to claim 11, wherein the chemical reagents may be impregnated on a range of porous materials, pads or strips.

13. An integrated liquid sampling and testing device according to claim 12, in which the porous materials, strips or pads may be single or multiple in order to conduct multiple analysis within the same device.

14 An integrated liquid sampling and testing device that can be placed in any form of potable liquid.

15. An integrated liquid sampling and testing device that when placed according to claim 14 and compressed at the sealed end air is expelled from the device, and upon release of the compression allows liquid to enter the device.

16. An integrated liquid sampling and testing device according to claims 1 to 15, in which any excess liquid not absorbed by the porous substrate

is trapped around the internal pipette by gravity and surface tension effects and only air is expelled from the device through the pipette opening

17 An integrated liquid sampling and testing device according to claims 1 to 16, in which the body comprises a window for viewing the collected liquid and indicator means.

18. An integrated liquid sampling and testing device according to claims 1 to 17 in which the body includes a display for displaying results of substance evaluation.

19. An integrated liquid sampling and testing device for evaluating substances within potable liquids, substantially as hereinbefore described with reference, and as illustrated in, the accompanying Figures.

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Application No: GB0610167.9 **Examiner:** Dr J.P. Bellia

Claims searched: 1-19 **Date of search:** 13 September 2007

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-4, 6-14, 17, 18	WO96/27795 A1 (MITCHEL & SPIELBERG) See Figures 4a and 4b
X	1-3, 7, 14, 17, 18	WO2006/018619 A1 (CHECKMATE) See paragraphs 19 and 26
X	1-4, 6, 7, 14, 15, 17, 18	US3768978 A (GRUBB et al) See column 1 line 34-53
X	1-4, 14, 17, 18	US2003/026731 A1 (PETER) See Figures

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

G01N

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
G01N	0033/14	01/01/2006